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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/837,387	04/19/2001	Juan G. Gonzalez	2925-0495P	7292
30594	7590	05/22/2006	EXAMINER	
		HARNESS, DICKEY & PIERCE, P.L.C.	KIM, KEVIN	
		P.O. BOX 8910	ART UNIT	PAPER NUMBER
		RESTON, VA 20195	2611	

DATE MAILED: 05/22/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	Application No.	Applicant(s)
	09/837,387	GONZALEZ ET AL.
	Examiner Kevin Y. Kim	Art Unit 2611

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) Responsive to communication(s) filed on 08 March 2006.
- 2a) This action is **FINAL**.                            2b) This action is non-final.
- 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) Claim(s) 1-3,5-7 and 9-12 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) Claim(s) \_\_\_\_\_ is/are allowed.
- 6) Claim(s) 1-3,5 and 9-12 is/are rejected.
- 7) Claim(s) 6 and 7 is/are objected to.
- 8) Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) The specification is objected to by the Examiner.
- 10) The drawing(s) filed on \_\_\_\_\_ is/are: a) accepted or b) objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) All    b) Some \* c) None of:
  1. Certified copies of the priority documents have been received.
  2. Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)	4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)	5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)
3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.	6) <input type="checkbox"/> Other: _____.

## **DETAILED ACTION**

### ***Response to Arguments***

1. Applicant's arguments filed on March 8, 2006 have been fully considered but they are not persuasive.

Applicant traverses the rejection of the claims by asserting that the prior art reference fails to teach "a weighted average" of a plurality of channel estimates because the reference teaches "the averaging of more than one channel estimate." Applicant further appended definitions of the terms "weighted average" and "arithmetic mean." Admittedly, the prior art, the US patent to Piirainen, fails to specifically teach a weight average. However, an arithmetic mean is a case of a weighted average where equal weighting is applied to individuals.

Although applicant discloses a specific weighting scheme at page 9 (equation 9), "a weighted average" recited in the claims is not just limited to the disclosed weighting conditions where possibly different weights are assigned to each channel estimate. Reading the specification into the claims is not permitted. In other words, since the claims do not exclude the case of a weighted average with equal weighting, the Piirainen patent, disclosing at least that case of equal-weighted average of a plurality of channel estimates, meets the scope of the claims.

A prior art reference (US 6,385,185) describes generating a channel estimate which is a weighted average of past channel estimates where equal weighting is used, showing that the average is a special case of a weighted average. See col.5, lines 43-46.

In summary, since the averaging of a plurality of channel estimates, taught by the prior art reference, is also "a weighted average" where weights are equal, the reference anticipates the claimed invention.

2. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

***Claim Rejections - 35 USC § 102***

3. Claims 1-3,5,9-12 are rejected under 35 U.S.C. 102(e) as being anticipated by Piirainen (US 6,748,031, previously cited).

Claims 1 and 2.

Piirainen discloses a method of estimating a communication channel (see Fig.2), comprising;

“determining at least first and second confidence levels that a transmitted data symbol has respective first and second values based on a received data symbol corresponding to the transmitted data symbol,” ( see col. 3, line 66 ~ col.4, line4 describing the confidence levels or probabilities of a received symbol y having one of a plurality of values x);

“generating a channel estimate based on the first and second confidence levels over a time window of predetermined width,” (see col.4, lines 32-49 describing the calculation of a channel estimate using the probabilities of a received symbol y having one of a plurality of values x, and col.3, lines 51-54) and

generating an overall channel estimate by obtaining a weighted average of a plurality of channel estimates. (see col. 4, lines 60-63)

Claim 3.

The calculation of a channel estimate is based on the confidence levels of the received symbols since it used the mean of the probabilities/confidence levels as well as the received data symbol  $y_k$ . See the equation at col.4, lines 35-40.

Claim 5.

Referring to Fig.2, Piirainen discloses a method of making a channel estimate, comprising:

“generating a confidence factor according to a confidence function and a received data symbol, the confidence factor representing a confidence level that a transmitted data symbol corresponding to the received data symbol has a particular symbol value,” (see col. 3, line 66 ~ col.4, line 4 describing probabilities of a received symbol  $y$  having one of a plurality of values  $x$ , i.e., the confidence factor according to “a confidence function,” i.e., a Viterbi detecting function, see col.3, line 66 ~ col.4, line 4);

“generating a channel estimate based on the confidence factor and the received data symbol over a time window of predetermined width.” (see col.4, lines 32-49 describing the calculation of a channel estimate using the probabilities of a received symbol  $y$  having one of a plurality of values  $x$  and col.3, lines 51-54.) and

“generating an overall channel estimate by obtaining a weighted average of a plurality of channel estimates.” (see col. 4, lines 60-63)

Claim 9.

Referring to Fig.2, Piirainen discloses a method of making a channel estimate, comprising:

“determining a strength indicator based on a received data symbol corresponding to a transmitted data symbol, a value of the strength indicator indicating a likelihood that the transmitted data symbol is a particular value,” (see col. 3, line 66 ~ col.4, line 4 describing probabilities of a received symbol  $y$  having one of a plurality of values  $x$ , i.e., “a strength indicator” of the received symbol);

“generating a channel estimate based on the confidence factor and the received data symbol over a time window of predetermined width  $l$ .” (see col.4, lines 32-49 describing the calculation of a channel estimate using the probabilities of a received symbol  $y$  having one of a plurality of values  $x$  and col.3, lines 51-54) and

“generating an overall channel estimate by obtaining a weighted average of a plurality of channel estimates.” (see col. 4, lines 60-63)

Claims 10 and 11.

Piirainen teaches a binary modulation, one of which is the bi-phase shift keying, where a transmitted symbol obtains the values of 1 or -1. See col. 4, lines 22-24. Thus, the strength indicator, i.e., a numeral representation of probability, approaches a value of 1 the greater the likelihood that the transmitted data symbol was 1 and approaches a value of -1 the greater the likelihood that the transmitted data symbol was -1.

Claim 12.

The claim calls for performing the probability determinations and the strength indicator determination according to a predetermined function. Piirainen teaches describing computing the probabilities according to a Viterbi detecting function. See col.3, line 66 ~ col.4, line 4

***Allowable Subject Matter***

4. Claims 6 and 7 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

***Conclusion***

3. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Hosur et al (US 6,331,975), Summartino et al (US 6,511,280), Kim et al (US 6,868,112) each teach a weighted average of channel estimates.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kevin Y. Kim whose telephone number is 571-272-3039. The examiner can normally be reached on 8AM --5PM M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jay Patel can be reached on 571-272-2988. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

May 17, 2006

KVK  
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JAY K. PATEL  
SUPERVISORY PATENT EXAMINER